

REMARKS

Applicant graciously acknowledges the interview conducted with the Examiner on May 8, 2006. Applicant has attempted to address the issues discussed in the interview with this response.

Applicant has studied the Final Office Action dated December 12, 2005 and the Advisory Action dated April 28, 2006. Claims 1-29 are pending. Claims 1 and 17 are independent claims. It is submitted that the application is in condition for allowance. Reconsideration and reexamination are respectfully requested.

Finality of Office Action

In the interview conducted on May 8, 2006, the remarks presented in the prior response submitted on April 11, 2006 to the Final Office Action dated December 12, 2005 were discussed. It was respectfully noted that a second or subsequent action on the merits should not be final “where the examiner introduces a new ground of rejection that is neither necessitated by applicant’s amendment of the claims nor based on information submitted in an information disclosure statement filed during the period set forth in 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p).” M.P.E.P. § 706.07(a). It was further respectfully noted that the amendments to the claims in the previous response to the Office Action issued on June 3, 2005 were in response to § 112 rejections and not related to the reference cited by the Examiner in the § 102 rejections and, therefore, did not necessitate new grounds for rejection. Moreover, it was respectfully noted that the Examiner has cited a new reference, Fujiwara et al., in the present Final Office Action that was neither cited in the previous Office Action nor submitted in an information disclosure statement. Moreover, it is respectfully noted that the Examiner has not indicated in the present Final Office Action whether Fujiwara et al. is being cited as a § 102 or § 103 reference.

Therefore, it was respectfully submitted that the previous Final Office Action was premature and it was respectfully requested that the Examiner withdraw the finality of the Office Action. In the interview, the Examiner apparently agreed that the finality of the previous Office Action would be withdrawn and another Office Action issued to address the following remarks.

§ 102 Rejections

Claims 1-29 were rejected under 35 U.S.C. § 102(b) as being anticipated by Honjo (U.S. Patent No. 5,404,581). This rejection is respectfully traversed.

It is respectfully noted that a proper rejection for anticipation under § 102 requires complete identity of invention. The claimed invention, including each element thereof as recited in the claims, must be disclosed or embodied, either expressly or inherently, in a single reference. Scripps Clinic & Research Found. v. Genentech Inc., 927 F.2d 1565, 1576, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991); Standard Havens Prods., Inc. v. Gencor Indus., Inc., 953 F.2d 1360, 1369, 21 U.S.P.Q.2d 1321, 1328 (Fed. Cir. 1991).

It is respectfully noted that the Examiner asserts, at paragraph 3 on page 2 of the Office Action, that Honjo discloses “in figures 2-4” that “the antenna 31, the low noise amplifier 34, and the phase shifter 37 are formed on one high resistance substrate.” It is further respectfully noted that the Examiner asserts, at paragraph 4 on page 3 of the Office Action, that “Honjo does teach a high resistance substrate 1” in that “Figure 2 shows the substrate 1 being a semi-insulation GaAs substrate” and that Fujiwara et al. discloses that a “semi-insulation GaAs substrate … should be a high-resistance substrate.” Applicant respectfully disagrees with the Examiner’s interpretation of Honjo and Fujiwara et al.

It is respectfully noted that the present invention relates to a smart antenna system and a method for fabricating an inductor that defines a phase shifter having better quality factor than a quality factor of an inductor fabricated by MMIC on a semiconductor substrate. It is respectfully submitted that forming a phase shifter, that has been fabricated on a semiconductor substrate, on a high resistance substrate, enhances a quality of a smart antenna to implement change of a directional angle by using at least one phase shifter.

However, it is respectfully noted that Honjo discloses complex structure of a semi-insulated substrate with a few semiconductor devices built in the substrate. Furthermore, it is respectfully noted that Honjo teaches how to integrate semiconductor devices, such as bipolar transistors used for an active circuit, on a semi-insulation substrate, such as GaAs or InP, and a semiconductor substrate, such as p-Si. Therefore, it is respectfully submitted that Honjo teaches only a structure to integrate semiconductor devices and contact electrodes on each substrate and to combine the substrates together in accordance with the contact electrodes on each substrate.

It is respectfully noted that the present invention discloses a fabrication method and a structure of an inductor that has a better quality factor used for a phase shifter that defines efficiency of a smart antenna system. It is respectfully submitted that the method of the present invention facilitates an inductor structure made of a high-resistance substrate followed by a regular process to fabricate a high resistance.

However, it is respectfully noted that Honjo only discloses a new process of fabricating each semiconductor substrate with semiconductor devices and a conductive object, such as micro strip lines and metal contacts, and combining each separately fabricated module-like substrate. Therefore, it is respectfully submitted that the complex structure of Honjo requires a complex formation process.

It is respectfully noted that at least one substrate used in Honjo must be a semiconductor substrate for integrating bipolar transistors according to an ordinary semiconductor transistor fabrication process, such as a process for doping dopants. Therefore, it is respectfully submitted that Honjo requires a GaAs, InP or p-Si substrate to be used in order to integrate semiconductor devices.

However, it is respectfully noted that the present invention allows use of high resistance substrates for forming a required structure. It is respectfully submitted that the structure of the present invention clearly does not require forming transistors on a high resistance substrate by doping dopants on the substrate.

It is respectfully noted that the substrates used in Honjo must be combined with each other by a precision aligning process due to the 3-D structures of each surface of each substrate. Therefore, it is respectfully submitted that the Honjo antenna system requires more complexity to manufacture than that of the present invention.

It is respectfully submitted that the semi-insulation substrate used in Honjo is **not** a high resistance substrate since the semi-insulation substrate needs semi-conductivity. It is further respectfully submitted that it is clearly understood by one of ordinary skill in this art that the word “high resistance,” as used in the claims of the present invention, means “non-conductive.”

It is respectfully noted that Fujiwara et al., which the Examiner asserts as disclosing that “a semi-insulation substrate” is ‘high-resistance,’ only discloses GaAs substrates having a LED array thereon. It is further respectfully noted that Fujiwara et al. teaches the use of another

dielectric layer between the semi-insulation substrate and leads or interconnection lines for isolation, as evidenced by “dielectric film 11” in FIG. 2.

It is respectfully submitted that, even if the LED array of Fujiwara et al. has a GaAs semi-insulation substrate as a high-resistance substrate, the semi-insulation substrate is used with its transparency and conductivity. It is further respectfully submitted that the purpose of GaAs substrates for LED structure is well-known in the optical device art and that GaAs substrates may be used as an n-contact or a p-contact of the LED, thereby requiring the GaAs substrate to have an ability to drive a current and precluding “high-resistance” as asserted by the Examiner.

It is respectfully noted that the semi-insulation substrate should not be used for a perfect isolation in Fujiwara. It is respectfully submitted that the present invention facilitates a method for fabricating a high quality factor inductor on a high resistance substrate that shows a perfect isolation characteristic. It is further respectfully submitted that one of ordinary skill in the related art would interpret “high resistance,” as used in the claims of the present invention as “nonconductive” or “hardly conductive” and that quality of an inductor on a nonconductive substrate is better than quality of an inductor on a semi-conductive substrate.

It is respectfully noted that the present invention facilitates a smart antenna system that relies on the quality of a phase shifter and the quality of a phase shifter relies on the inductor. However, it is respectfully submitted that Honjo does not teach a structure or fabrication method for a high quality factor inductor.

Therefore, it is respectfully asserted that independent claims 1 and 17 are allowable over the cited references. It is further respectfully asserted that claims 2-16, which depend from claim 1, and claims 18-29, which depend from claim 17, also are allowable over the cited references.

CONCLUSION

In light of the above remarks, Applicant submits that claims 1-29 of the present application are in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

No amendment made was related to the statutory requirements of patentability unless expressly stated herein; and no amendment made was for the purpose of narrowing the scope of any claim, unless Applicant has argued herein that such amendment was made to distinguish over a particular reference or combination of references.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 623-2221 to discuss the steps necessary for placing the application in condition for allowance.

Respectfully submitted,

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